

## Week 11

### This week in a nutshell:

This week sees some concepts from algebra that will be extended throughout high school, such as forming an equation, as well as the distributive law via factorisation. The number work will require pen and paper methods, and as always time should be taken to discuss the different methods available for these types of questions.

**Question 1:** Mental methods with decimals (+/-)

**Question 2:** BIDMAS

**Question 3:** Using powers with algebra

**Question 4:** Letter as numbers (writing equations)

**Question 5:** Understanding factorisation

The questions aim to develop and deepen understanding over the week. Due to the necessity of the topics covered this week, there is an emphasis on the interchangeability of command words, and language flexibility. It may be worth taking some extra time this week to make sure your students are developing their mathematical literacy.

### This week's ideas for class discussion include:

**Question 1: Mental methods with decimals (+/-)**

- How do you decide when to use a mental method or written method?

**Question 2: BIDMAS**

- Can you think of a better way to remember the order of operations than "BIDMAS"?

**Question 3: Using powers with algebra**

- Do powers behave differently with algebra?

**Question 4: Letter as numbers (writing equations)**

- Why might forming an equation be preferable to a worded problem?
- Are equations the same in every language? Why?

**Question 5: Understanding factorisation**

- How would you summarise the distributive law in terms of expansion and factorisation?
- Does every process have an inverse?

## Week 11: Day 1

1) **Work out:**

a)  $1.8 + 3.2$

b)  $10 - 7.3$

---

2) **Evaluate**

$$2 \times 4 + 5 \times 6$$


---

3 **Simplify**

$$3a \times 3a$$


---

4) **Write an equation that means the same as**

“Nine plus a number is the same as thirteen”

---

5) **Fill in the missing term to make this factorisation correct:**

$$\underline{\hspace{2cm}} + 4 = 2(3x + 2)$$

## Week 11: Day 1 Answers

1) **Work out:**

a)  $1.8 + 3.2 = 5$

b)  $10 - 7.3 = 2.7$

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2) **Evaluate**

$$\begin{aligned} 2 \times 4 + 5 \times 6 \\ = 8 + 30 \\ = 38 \end{aligned}$$

---

3) **Simplify**

$$3a \times 3a = 9a^2$$

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4) **Write an equation that means the same as**

“Nine plus a number is the same as thirteen”

$$9 + n = 13$$

Or  $n + 9 = 13$

---

5) **Fill in the missing term to make this factorisation correct:**

$$\underline{6x} + 4 = 2(3x + 2)$$

## Week 11: Day 2

1) **Work out:**

a)  $5.4 + 7.6$

b)  $11 - 9.1$

---

2) **Work out**

$$36 \div 3^2$$

---

3) **Simplify**

$$(5b)^2$$

---

4) **Write an equation that means the same as**

“Twenty-one is equal to a number minus sixteen”

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5) **Fill in the missing term to make this factorisation correct:**

$$8x + \underline{\hspace{2cm}} = 4(2x + 3)$$

## Week 11: Day 2 Answers

1) **Work out:**

a)  $5.4 + 7.6 = 13$

b)  $11 - 9.1 = 1.9$

---

2) **Work out**

$$\begin{aligned} & 36 \div 3^2 \\ &= 36 \div 9 \\ &= 4 \end{aligned}$$

---

3) **Simplify**

$$(5b)^2 = 25b^2$$

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4) **Write an equation that means the same as**

“Twenty-one is equal to a number minus sixteen”

$$21 = n - 16$$

---

5) **Fill in the missing term to make this factorisation correct:**

$$8x + 12 = 4(2x + 3)$$

## Week 11: Day 3

1) **Work out:**

a)  $2.9 + 3.7$

b)  $11.2 - 2.4$

---

2) **Determine**

$$8^2 - 35 \div 5$$

---

3) **Simplify**

$$(2n)^3$$

---

4) **Write an equation that means the same as**

“A number divided by six equals eleven”

---

5) **Fill in the missing term to make this factorisation correct:**

Fill in the missing term to make this factorisation correct:

$$x^2 + \underline{\hspace{1cm}} = x(x + 2)$$

## Week 11: Day 3 Answers

1) **Work out:**

a)  $2.9 + 3.7 = 6.6$

b)  $11.2 - 2.4 = 8.8$

2) **Determine**

$$\begin{aligned} &8^2 - 35 \div 5 \\ &= 64 - 7 \\ &= 57 \end{aligned}$$

3) **Simplify**

$$(2n)^3 = 8n^3$$

4) **Write an equation that means the same as**

“A number divided by six equals eleven”

$$\frac{n}{6} = 11$$

5) **Fill in the missing values to make this factorisation correct.**

$$x^2 + \underline{2x} = x(x + 2)$$

## Week 11: Day 4

1) **Work out:**

a)  $15.6 + 5.8$

b)  $13.1 - 4.5$

---

2) **Work out**

$$(3^2 - 8) - (5 - 2^2)$$

---

3) **Simplify**

$$(3a)^2 + (3a)^2$$

---

4) **Write an equation that means the same as**

“I divide a number by 3 and then add 7. The answer is 8”

---

5) **Fill in the missing term to make this factorisation correct:**

$$9x + 15 = 3(\underline{\quad} + 5)$$



## Week 11: Day 4, Answers

1) **Work out:**

a)  $15.6 + 5.8 = 21.4$

b)  $13.1 - 4.5 = 8.6$

2) **Work out**

$$\begin{aligned}(3^2 - 8) - (5 - 2^2) \\&= (9 - 8) - (5 - 4) \\&= 1 - 1 \\&= 0\end{aligned}$$

3) **Simplify**

$$\begin{aligned}(3a)^2 + (3a)^2 \\&= 9a^2 + 9a^2 \\&= 18a^2\end{aligned}$$

4) **Write an equation that means the same as**

“I divide a number by 3 and then add 7. The answer is 8”

$$\frac{n}{3} + 7 = 8$$

5) **Fill in the missing term to make this factorisation correct:**

$$9x + 15 = 3(3x + 5)$$

## Week 11: Day 5

1) **Work out:**

a)  $2.7 + 12.7$

b)  $14.8 - 6.9$

---

2) **Calculate**

$$(25 - 4 \times 5) \div 5$$

---

3) **Simplify**

$$(2k)^4 - k^4$$

---

4) **Write an equation that means the same as**

“Two lots of a number is subtracted from thirty. The result is fourteen”

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5) **Fill in the missing term to make this factorisation correct:**

$$15x^2 + 5x = 5x(\_\_ + 1)$$

## Week 11: Day 5, Answers

1) **Work out:**

a)  $2.7 + 12.7 = 15.4$

b)  $14.8 - 6.9 = 7.9$

2) **Calculate**

$$\begin{aligned} & (25 - 4 \times 5) \div 5 \\ &= (25 - 20) \div 5 \\ &= 5 \div 5 \\ &= 1 \end{aligned}$$

3) **Simplify**

$$\begin{aligned} & (2k)^4 - k^4 \\ &= 16k^4 - k^4 \\ &= 15k^4 \end{aligned}$$

4) **Write an equation that means the same as**  
“Two lots of a number is subtracted from  
thirty. The result is fourteen”

$$30 - 2n = 14$$

5) **Fill in the missing term to make this factorisation correct:**

$$15x^2 + 5x = 5x(\underline{3x} + 1)$$

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